System Management Hub Installation for Natural Manager

For Natural Manager, the System Management Hub server is installed on the mainframe under OS/390. The client is a Javascript-enabled browser (Netscape 4.7 or Internet Explorer 4.01, 5.0, and 5.5).

This document is organized as follows:

Before You Install

The installation of Natural Manager includes the installation of a server environment with System Management Hub (ARG), Software AG base technology (BTY), and a runtime system (APS).

Under OS/390, the server environment runs in a single address space. Within that address space, the System Management Hub servers (HTTP, MIL, and agent) run using the runtime system.

Before you start the installation procedure, you must have the following environment available:

- OS/390 version 2.6 or above;
- For RACF or ACF2 security privileges, the server environment started task (SSE) must have a USS segment (formerly called an OE segment) for a socket;
- Access to the IBM TCP/IP stack: this means the user IDs must be USS users;
- 150 cylinders of space on 3390 disks must be available for the installation datasets;
- Three (3) free port numbers for the HTTP, MIL, and agent servers.

Contents of the Installation Tape

You will receive a tape containing the mainframe files. There are two components on the tape:

- Natural Development Server
- System Management Hub for Natural

The following datasets refer to the System Management Hub for Natural. For details on the Natural Development Server part, refer to Natural Development Server Installation under OS/390.

Tape Dataset	Dataset Type	Description
NDV112.AZIP	Binary data, PS, (U, 6447)	Data to be loaded into the portable file system (PFS) including the XML templates for Natural Manager
NDV112.JOBS	PO, (FB, 6320, 80), EBCDIC	Jobs for installing, administering, and operating Natural Manager
NDV112.LB00	Load library, PO, (U, 6447)	Batch executables
NDV112.LE00	Load library, PO, (U, 6447)	Server environment agents for Natural Manager
NDV112.SARG	PO, (FB, 10240, 512), EBCDIC	Registry data for the runtime system
APS251.SXML	PO, (FB, 10240, 512), EBCDIC	System Management Hub templates for the runtime system
APS251.LB00	Load library, PO, (U, 6447)	Batch environment agents for the runtime system
APS251.LD00	Load library, PO, (U, 6447)	Load library for the runtime system
APS251.LE00	Load library, PO, (U, 6447)	Server environment agents for the runtime system
APS251.SRCE	PO, (FB, 6320, 80), EBCDIC	Source and jobs dataset for the runtime system
ARG122.AZIP	Binary data, PS, (U, 6447)	Zip file for System Management Hub
ARG122.SARG	PO, (FB, 10240, 512), EBCDIC	Registry data for System Management Hub
ARG122.LB00	Load library, PO, (U, 6447)	Batch environment agents for System Management Hub
ARG122.LD00	Load library, PO, (U, 6447)	Load library for System Management Hub
ARG122.LE00	Load library, PO, (U, 6447)	Server environment agents for System Management Hub
ARG122.SRCE	PO, (FB, 6320, 80), EBCDIC	Source and jobs dataset for System Management Hub
BTY115.ECSO	Binary data library, PO, (U, 4096)	Translation tables for Software AG base technology
BTY115.LB00	Load library, PO, (U, 6447)	Batch environment agents for Software AG base technology
BTY115.LD00	Load library, PO, (U, 6447)	Load library for Software AG base technology

Contents of the Jobs Library

The NDVvrs.JOBS library contains

- Jobs for installation steps (J#cccccc);
- JCL procedures and sample jobs used in installation (P#cccccc);
- Configuration parameter members (cccccccc); and
- Other sample jobs (X#cccccc).

Note:
Configuration members are copied from the SARG dataset to the JOBS dataset during step 2 when applying parameter replacements.

Jobs for Installation Steps

JCL Member	Purpose
J#COPYM	Installation step 1: Allocates and populates user-modifiable JCL libraries
J#PARSUB	Installation step 2: Sets configuration parameters in jobs, procedures, and parameter members
J#PFSINI	Installation step 3: Allocates and formats the portable file system (PFS) containers
J#REGINI	Installation step 4: Creates and loads the registry into the file systems.
J#UNZIP	Installation step 5: Loads the System Management Hub and the runtime system data

JCL Procedures and Sample Jobs Used in Installation

JCL Member	Description
P#ARGB	ARGBATCH procedure
P#BAT	Batch procedure
P#PARSUB	Procedure for the substitution job J#PARSUB
P#SRV	Server procedure (started task)

Configuration Parameter Members

Parm Members	Description
ENV	Server environment variables
ENVB	ARGBATCH environment variables
PARSUB	Current values for the J#PARSUB job
PARSUBEG	Example of current values for the J#PARSUB job
REGCONV	Registry configuration
SYPARGB	ARGBATCH sysparm member
SYPBAT	Batch sysparm member
SYPINIT	Initial sysparm member
SYPSRV	Server sysparm member

Other Sample Jobs

JCL Members	Purpose
X#PFSDIS	Job to display PFS contents
X#PFSEXP	Job to export files from PFS
X#PFSIMP	Job to import files to PFS
X#REGUPD	Job to update registry options
X#UNZIP	Job to unzip into PFS
Z#UNZIP	Copyright disclaimer for UNZIP
X#REGNUC	Job to register Natural nuclei
X#REGSYS	Job to register Natural system files

Copying the Installation Tape to Disk

If you have Software AG's System Management Aid (SMA) installed, you may use it to copy the Natural Manager installation tape to disk. For information about using SMA, refer to the System Maintenance Aid Manual.

Note:
SMA does not support the entire installation process; only copying the tape to disk.

Copying the Tape Contents to Disk

If you are not using SMA: Copy the job dataset NDV*nnn*.JOBS from tape to disk using the sample JCL below.

The following values must be supplied in the JCL:

1. In the dataset names, replace *nnn* with the current version number of the datasets.
2. With the SER parameter, replace *XXXXXX* with the volume serial number of the tape .
3. With the LABEL parameter, replace *x* with the sequential number of the tape dataset (see the **Report of Tape Creation**).
4. With the VOL=SER parameter, replace *YYYYYY* with the volume serial number of the disk pack.

```
// JOB CARD
//V2COPY   EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=A
//IN1      DD DSN=NDVnnn.JOBS,DISP=OLD,UNIT=TAPE,
//   VOL=(,RETAIN,SER=XXXXXX),LABEL=(x,SL)
//OUT1     DD DSN=SAGLIB.NDVnnn.JOBS,DISP=(NEW,CATLG,DELETE),
//   UNIT=SYSDA,VOL=SER=YYYYYY,SPACE=(CYL,(1,1,10))
//SYSIN    DD *
C I=IN1,O=OUT1 /*
```

Adapt and run job NDVTAPE from the job dataset to copy the load and source libraries from tape to disk, unless already done during the installation of the Natural Development Server part.
Note that the job NDVTAPE contains the JCL to copy the datasets of both the Natural Development Server and the System Management Hub for Natural.
The sample jobs directly use the sequential datasets from tape

Installation Overview

After unloading the installation tape to disk, install Natural Manager using the following steps:

1. Allocate and populate user-modifiable copies of the JCL files (job J#COPYM).
2. Set the configuration parameters in jobs, procedures, and parameter members (job J#PARSUB).
3. Allocate and format the PFS files (job J#PFSINI).
4. Set up the registry files (job J#REGINI).
5. Initialize the System Management Hub (job J#UNZIP).
6. (Optional) Update the registry options (job X#REGUPD).
7. Register nuclei and system files.
8. Start the JCL server procedure P#SRV as a started task.

Rerunning Installation Steps

You can rerun installation steps when a parameter changes, for example. Note the following, however:

- If you change parameters in step 2, you must repeat all following steps except step 7.
- If you repeat step 4 or 5, you may receive errors related to changes (such as the creation of a subdirectory) that were made to the portable file system (PFS) in the previous execution.

Condition Codes

The System Management Hub utility ARGEXEC in J#PFSINI, J#REGINI, and J#UNZIP behaves like a shell in which programs execute. An error from a program running in the shell is not passed as a condition code, which means that you need to check the job output to determine successful completion.

Step 1. Allocate and Populate Copies of the JCL Libraries

Member J#COPYM in the NDV112.JOBS dataset provides JCL to allocate and populate user-modifiable copies of the JCL libraries.

To allocate and populate copies of the JCL libraries

1. Adapt the job J#COPYM in the NDV112.JOBS dataset to your site requirements. Set a value for the job statement; supply the SET statements with the same values you use for the PARSUB member (see step 2).
2. Submit J#COPYM.

Step 2. Set the Configuration Parameters

Note:
The PARSUB configuration variables provide a basic setup for the product. Once you have this setup, you can modify other variables in other members for a more customized configuration, as required.

This step comprises the following substeps:

1. Set configuration parameters in the PARSUB member in the NDV112.JOBS dataset.
2. Adapt the job J#PARSUB in the NDV112.JOBS dataset to your site requirements.
3. Run the J#PARSUB job.

Step 2.1 Configure the PARSUB Member

The variables in the PARSUB member can be replaced. Ensure that the replacement value is after the equals sign (=) and is enclosed in (double) quotation marks.

```
"<NATURAL_LOAD>"="Natural LOAD LIBRARY"
"<ADABAS_SVC>"="249"
"<HILEV>"="highlevel-dataset-qualifier-with-dot"
"<HILEV_SLASH>"="highlevel-dataset-qualifier-with-slash"
"<HOST>"="host-system-name"
"<JOBPAR>"="job-parameters-in-job-statement"
"<LOCATION>"="UNIT=xxxx,VOL=SER=vvvvvv"
"<MILTCPIP_HOSTNAME>"="internet-host-name"
"<MILHTTP_PORT>"="9991"
"<MIL_PORT>"="9990"
"<MYHIL>"="highlevel-dataset-qualifier-for-user-modifiable-jcl-datasets"
"<SC_PORT>"="9900"
"<SYSTCPD>"="systcpd-dataset-name"
"<TCP_ADDRESS_SPACE>"="jobname-of-tcpip-task"
"<USER_ID>"="userid"
```

The variables in the PARSUB member are described in the following table:

Variable	Description
NATURAL_LOAD	the Natural batch library. The dataset which contains the executable Natural nucleus.
ADABAS_SVC	the Natural SVC of the databases that Natural Manager will access (default 249).
HILEV	the high-level qualifier under which the datasets were unloaded from the installation tape using a period as a delimiter. These datasets are read-only.
HILEV_SLASH	the high-level qualifier of the database datasets using a forward slash (/) as a delimiter. These datasets are customized for the installation and are read/write (JOBS, SARG, PFS, PFSB).
HOST	the SSE system name used as identification in console messages.
JOBPAR	the parameters used in the JOB statement of Natural Manager installation jobs.
LOCATION	a valid storage location for the PFS container files.
MILTCPIP_HOSTNAME	the internet name of the host where the MIL server is to run; that is, the host-name - domain-name or the TCP/IP address. For standard installations, "localhost" is appropriate.
MILHTTP_PORT	an available IP port for the HTTP listener of the MIL server on the runtime system.
MIL_PORT	an available IP port for the MIL server on the runtime system.
MYHIL	the high-level qualifier under which job J#COPYM allocates user-modifiable copies of the JCL libraries using a period as a delimiter. These datasets are read/write.
SC_PORT	an available IP port for the System Management Hub daemon (agent server).
SYSTCPD	the TCPIP.DATA configuration file; that is, the dataset/member for the SYSTCPD DD statement of the IBM TCP/IP stack.
TCP_ADDRESS_SPACE	the job name of the TCP/IP stack that the server address space will use.
USER_ID	a valid user name for the person who will administer the System Management Hub environment. This is used as the job name prefix in the installation jobs. Additional names may be added later. **Note:** User names are case-sensitive. Software AG recommends entering the user name always in uppercase.

Note:
You are required to specify three IP ports during installation: <MILHTTP_PORT>, <MIL_PORT>, and <SC_PORT>, the mimumum number required for use by the System Management Hub.

An example of the PARSUB member with values replaced is provided in member PARSUBEG:

```
"<NATURAL_LOAD>"="AST.NAT315.LOAD"
"<ADABAS_SVC>"="235"
"<HILEV>"="AST.COMN.A2"
"<HILEV_SLASH>"="AST/COMN/A2"
"<HOST>"="AST3F"
"<JOBPAR>"="AST,CLASS=K,MSGCLASS=X"
"<LOCATION>"="UNIT=3390,VOL=SER=NAT005"
"<MILTCPIP_HOSTNAME>"="LOCALHOST"
"<MILHTTP_PORT>"="7335"
"<MIL_PORT>"="7336"
"<MYHIL>"="AST.COMN.A4"
```



```
"<SC_PORT>"="7337"
"<SYSTCPD>"="SYSM.DAEF.PARMLIB(TCPDAT3F)"
"<TCP_ADDRESS_SPACE>"="DA3FTCP"
"<USER_ID>"="AST"
```

Configuring Communications for the TCP/IP Stack

System Management Hub supports the IBM OpenEdition TCP/IP stack. In the PARSUB variables, you have provided

- access to the TCPIP.DATA configuration file by allocating it statically in the SYSTCPD DD statement in the runtime JCL. However, there are other ways to make this configuration file available to System Management Hub. For more information, refer to the appropriate IP configuration manual for your OS/390 and TCP/IP release.
- the job name and host name of the TCP/IP stack that the server address space will use.

Configuring the Environment

Certain configuration information is obtained from environment variables. The NDV112.JOBS dataset contains two sample configuration members: ENV and ENVB.

Accept the settings in this file as delivered with the following exceptions:

Time Zone Setting

Set the time zone in the TZ parameter for the local time. For example, the time zone setting for German daylight saving time is `TZ=CET-2`.

ENVB Values

Env. Variable	Appropriate Values	Explanation
XTSDSURL	tcpip://<XTS_HOST>:12731	Identifies the XTS directory server by host name or IP address. **Note:** Required only if you plan to run any XTS-enabled products in the server address space (SSE).

Step 2.2 Adapt the Provided J#PARSUB Job

Adapt the J#PARSUB member to your local standards and dataset names.

To adapt the provided JCL

1. Add a valid job card.
2. Replace all occurrences of the string `<HILEV>` with the high-level qualifier under which the datasets were unloaded from the installation tape using a period as a delimiter.

   For example, if the load library NDV112.LB00 was downloaded as XZY.NDV112.LB00, then `<HILEV>=XYZ`. If NDV112.LB00 was downloaded as XZY.A4711.NDV112.LB00, then `<HILEV>=XYZ.A4711`

3. Replace all occurrences of the string <HILEV_SLASH> with the high-level qualifier of the database datasets, but using a forward slash (/) as a delimiter instead of a period.
4. Replace all occurrences of the string <MYHIL> with the high-level qualifier under which job J#COPYM allocated and populated the user-modifiable copies of the JCL libraries.

Step 2.3 Run the J#PARSUB Job

This job copies the installation members from NDV112.SARG (input for the registry update) into the NDV112.JOBS dataset and applies the parameter substitutions defined in PARSUB.

Step 3. Allocate and Format PFS Files

Member J#PFSINI in the <MYHIL>NDV112.JOBS dataset provides JCL to allocate and format PFS files necessary for System Management Hub data that will contain the registry and System Management Hub files.

To allocate and format the PFS container files

- Submit J#PFSINI.

Step 4. Set up the Registry

The registry is used by a number of components in the Natural Manager and System Management Hub environments.

You have already put all relevant variables into the PARSUB member and the job J#PARSUB has created a job that you can submit to set up the registry.

Member REGCONV from the NDV*vrs*.JOBS dataset contains variable substitution values used in loading the registry for establishing System Management Hub on the OS/390 host. The required substitution values were made in the REGCONV member when you submitted J#PARSUB. No other modifications are required.

Warning:
The following section is provided for your information only. Do not modify REGCONV unless requested to do so by Software AG.

Once your registry is established, the values you provide are not easily changed. They can be changed, however.

Registry Template Substitution Values

Site-specific values (right side of assignment) are provided for the variables (left side of assignment) in the REGCONV member. The replaceable values are enclosed in angles (<>).

Note:
If you are requested to modify the values, use an editor to search for and replace all occurrences, as some are repeated multiple times.

Following is a copy of the NDV112.JOBS(REGCONV) member, a template for registry conversion values that governs how System Management Hub is established in the runtime system environment:

```
REGCONV member-------------------------------------------------
#
# Substitution values used to build the initial registry.
#
# This file is used to make value substitutions within the registry
#
```

```
# Note: The only values that should be changed are those provided
#   within angle brackets (<>). Specifically, there are several file
#   names and prefixes that may not be changed. Activities outside
#   the bounds of these sanctioned changes will result in a broken
#   system.
#
#------------------------------------------------------------------------
* Natural Manager substitution values
#------------------------------------------------------------------------
nma_exe_path=FILE://<HILEV_SLASH>/NDV112/LE00
nma_lib_path=FILE://<HILEV_SLASH>/NDV112/LE00
nma_ver.rel.sm=1.1.2
nma_verrelsm=112
nma_template_path=//files/NDV112/files/xml
*
#------------------------------------------------------------------------
* System Management Hub substitutions
#------------------------------------------------------------------------
* 1. Port Numbers:
*
* MILayer Service:
MIL_PORT=<MIL_PORT>
MILHTTP_PORT=<MILHTTP_PORT>
MIL_HOST=<LOCAL_HOST_NAME>
*
* CSLayer Service:
SC_PORT=<SC_PORT>
*
*
PFS_ARGDIR=/files/Argus
ARGDIR=FILE://<HILEV_SLASH>/BTY115
ARGVERS=V122
SAG_USER=<USER_NAME>
ECSOBJDIR=FILE://<HILEV_SLASH>/BTY115/ECSO
#------------------------------------------------------------------------
* Runtime System substitution values
#------------------------------------------------------------------------
user_name=<USER_NAME>
aps_inst_path=FILE://<HILEV_SLASH>/APS251
aps_exe_path=FILE://<HILEV_SLASH>/APS251/LE00
aps_lib_path=FILE://<HILEV_SLASH>/APS251/LD00
aps_template_path=/files/APS
#
```

Following are the registry template substitution values used for System Management Hub:

Variable	=Value	Comments
nma_exe_path	FILE://<HILEV_SLASH>/NDV112/LE00	The load library into which the Natural Manager (NDV) executables were installed.
nma_lib_path	FILE://<HILEV_SLASH>/NDV112/LE00	The load library into which the Natural Manager (NDV) executables were installed.
nma_ver.rel.sm	1.1.2	Natural Manager version, revision, and system maintenance level numbers separated by '.'
nma_verrelsm	112	Natural Manager version, revision, and system maintenance level numbers concatenated.

Variable	=Value	Comments
nma_template_path	//files/NDV112/files/xml	The name of the subdirectory where XML templates were installed using the J#UNZIP job. This default value is assumed by the installation and should not be changed.
MIL_PORT	<MIL_PORT>	An available IP port for the MIL server on the runtime system.
MILHTTP_PORT	<MILHTTP_PORT>	An available IP port for the HTTP listener of the MIL server on the runtime system.
MIL_HOST	<LOCAL_HOST_NAME>	The host name where MIL server is to run; that is, the local host.
SC_PORT	<SC_PORT>	An available IP port.
PFS_ARGDIR	/files/Argus	A valid portable file system (PFS) directory path. This value is used when System Management Hub XML templates and other files (HTML, js, gif, etc.) are stored in the PFS. This is required when the intention is to run the MIL server on the runtime system.
ARGDIR	FILE://<HILEV_SLASH>/BTY115	Used in the dataset name prefix where XML templates are found. It then appends `FILES/XML/AGENTS` and `FILES/XML/AGENTS/BATCH` to this name to find required members.
ARGVERS	V122	Do not change this value.
SAG_USER	<USER_NAME>	A valid user name for the person who will administer the System Management Hub environment. Additional names may be added later. **Note:** User names are case-sensitive. Software AG recommends entering the user name always in uppercase.
ECSOBJDIR	FILE://<HILEV_SLASH>/BTY115/ECSO	The dataset containing translation objects.
user_name	<USER_NAME>	The user name of the person who will administer the runtime system nodes of the local host. This name will be validated. **Note:** User names are case-sensitive. Software AG recommends entering the user name always in uppercase.
aps_inst_path	FILE://<HILEV_SLASH>/APS251	The directory into which the runtime system (APS) load library was installed. The /APS241 part of the file name is the version level of the runtime system.
aps_exe_path	FILE://<HILEV_SLASH>/APS251/LE00	The load library into which the runtime system (APS) executables were installed.

Variable	=Value	Comments
aps_lib_path	FILE://<HILEV_SLASH>/APS251/LD00	The load library into which the runtime system (APS) executables were installed.
aps_template_path	/files/APS	The name of the file where XML templates were installed using the J#UNZIP job. This default value is assumed by the installation and should not be changed.

Note:
In the System Management Hub on OS/390, two types of files and file names are used:

- native OS/390 files; and
- files specified within the portable files system (PFS) in a UNIX-like manner.

It is important to be aware of the differences, and the context of the files and file names when you use them. For more information, see File Naming Specification for OS/390.

Establish the Registry

To format the registry file and process the template substitution values

1. Edit the job J#REGINI in the NDV112.JOBS dataset to meet the requirements at your site.
2. Submit the job J#REGINI.

In addition to processing the template substitution values, the job initializes two registry files: one for the server environment and one for the administrator's batch environment.

Step 5. Initialize the System Management Hub

Member J#UNZIP in the NDV112.JOBS dataset provides JCL for loading files required for the MIL server environment into the PFS container file that maps to the directory structure of PFS_ARGDIR when you initialize your registry, which is assumed to be `/files/Argus`.

To initialize System Management Hub

1. Edit the JCL member J#UNZIP to meet the requirements at your site.
2. Submit J#UNZIP to initialize System Management Hub.

The job creates the directory structures to contain the MIL files and imports the files from the installation zip file to the PFS.

Step 6. (Optional) Update the Registry Options

To update your registry options

1. Edit the job X#REGUPD to meet your site requirements.
2. Submit X#REGUPD.

Step 7. (Optional) Register Additional Nucleus and System Files

Step 7.1 Register Additional Nucleus

Member X#REGNUC in the <MYHIL>.NDV112.JOBS dataset provides JCL to register a Natural nucleus.

```
//<USER_ID>71 JOB <JOBPAR>
//*
//* -------------------------------------------------------------
//*
//* Execute agent to register Natural Nucleus.
//*
//* -------------------------------------------------------------
//*
//* Installation step 7:
//* Job can also be executed later, to register additional
//* Natural nucleus.
//*
//* Be sure to replace all occurrences.
//*
// SET HILEV=<HILEV>
// SET MYHIL=<MYHIL>
//*
// JCLLIB ORDER=&MYHIL..NDV112.JOBS
//*
//* -------------------------------------------------------------
//* register nucleus for server pfs
//* -------------------------------------------------------------
//REGNUC EXEC P#BAT
//PARMS DD *
natvers
Command=Register
Path=<NATURAL_LOAD>
Name=*
//*
//* -------------------------------------------------------------
//* register nucleus for batch pfs
//* -------------------------------------------------------------
//REGNUCB EXEC P#ARGB
//PARMS DD *
natvers
Command=Register
Path=<NATURAL_LOAD>
Name=*
/*
```

Modify the path(name of the dataset), where the natural nucleus is located and modify the name of the nucleus. If a ’*’ is used instead of a name, all nuclii in the dataset are registered.

Submit job X#REGNUC.

Step 7.2 Register System Files

Member X#REGSYS in the <MYHIL>.NDV112.JOBS dataset provides JCL to register Natural system files.


```
//<USER_ID>72 JOB <JOBPAR>
//*
//* -------------------------------------------------------------
//*
//* Execute agent to register Natural System File.
//*
//* -------------------------------------------------------------
//*
//* Installation step 7:
//* Job can also be executed later, to register additional
//* Natural system files.
//*
//* Be sure to replace all occurrences.
//*
// SET HILEV=<HILEV>
// SET MYHIL=<MYHIL>
//*
// JCLLIB ORDER=&MYHIL..NDV112.JOBS
//*
//* -------------------------------------------------------------
//* register system files for server pfs
//* -------------------------------------------------------------
//REGSYSS EXEC P#BAT
//PARMS DD *
natvers8
Command=Register
Database=<DATABASE_ID>
File=<FILE_NUMBER>
Password=
;
natvers8
Command=Register
Database=<DATABASE_ID>
File=<FILE_NUMBER>
Password=
;
//*
//* -------------------------------------------------------------
//* register system files for batch pfs
//* -------------------------------------------------------------
//REGSYSB EXEC P#ARGB
//PARMS DD *
natvers8
Command=Register
Database=<DATABASE_ID>
File=<FILE_NUMBER>
Password=
;
natvers8
Command=Register
Database=<DATABASE_ID>
File=<FILE_NUMBER>
Password=
;
/*
```

Replace <DATBASE_ID> by the number of the system files database and <FILE_NUMBER> by the file number of the system file. Enter the password, if the system file is protected.

Submit job X#REGSYS.

Step 8. Start the System Management Hub JCL Procedure

The JCL procedure P#SRV in the dataset NDV112.JOBS contains JCL to execute System Management Hub servers on the mainframe.

To start the JCL procedure

1. Edit the P#SRV member of the NDV112.JOBS dataset to meet the requirements at your site.

   Note:
   TCPIP.DATA must be available either by using the system default search (`TCPIP.TCIPI.DATA` or `SYS1.TCP.DATA`) or by using the `SYSTCPD DD` card in the JCL.

   The following DD statements have uses as indicated:

DD Name	Description
STDOUT	Used for miscellaneous output.
STDERR	Used for miscellaneous error and trace output.
APSLOG	Processes messages from the runtime system environment.
SYSPARM	Contains the runtime parameter input definitions.
CONFIG	Contains environment variable definitions.
PFS	Portable file system (PFS) container files.
SYSTCPD	Configuration file for the IBM OE TCP/IP stack.

2. Copy the member into a system procedure library (proclib).
3. Start the procedure using the OS/390 operator command START.
4. Use the OS/390 operator command STOP (P) to stop it again.

   You may alternatively use the operator command MODIFY (F): `MODIFY <started-task-name>,EOJ`

   Note:
   If you terminate the server using the operator command CANCEL, the TCP/IP port numbers used by System Management Hub may not be freed. In this case, use the appropriate commands to TCP/IP to display (NETSTAT) and free (DROP) the port numbers.

Verifying the Installation

After installing Natural Manager and System Management Hub on the mainframe, verify the installation by

1. invoking the System Management Hub startup JCL; and
2. connecting to the following URL from a valid workstation browser:
   `http://<host>:<MILHTTP_PORT>/smh/login.htm`

You are presented with the System Management Hub login screen allowing you to log in and start working with the Natural Manager environment.

Note:
If you have System Management Hub version 2.1.2 or above installed on non-OS/390 nodes (a Windows NT or 2000 node, for example), you need to copy additional icons from the OS/390 node into the "htmllayer/images/Natural" subdirectory of the target node. For example, on Windows NT, you need to copy the icons into "C:\Program

Files\Software AG\System Management Hub\htmllayer\images\natural". The additional icons are located on OS/390 in the NDVvrs.AZIP file under "Argus/htmllayer/images/natural". You can bring the file to the target system using FTP in binary mode and unzip it using standard ZIP tools.

File Naming Specification for OS/390

The runtime system allows file names to be mapped to specific file protocols; for example, native OS/390 file input/output. For this reason, the default configuration of your System Management Hub makes file name references to the native OS/390 file system explicitly and other files default to the portable file system (PFS).

File names are specified using a 'typical' open system structure with each node of the file name separated by forward slashes with a filetype designation. For example:`file://level1/level2/level3/level4/filename.filetype` -where 'file://' is a static label used to identify native OS/390 files.

While this appears as UNIX or Windows format, the only objective of the name is to uniquely identify the file. The various levels are interpreted to make a sensible file name for the file system where the file resides.

However, the syntax difference between OS/390 files can be subtle. For example:

File Name Specified	Refers to . . .
`file://level1/level2/level3/mbrname.filetype`	PDS member: `LEVEL1.LEVEL2.LEVEL3(mbrname);` **Note:** '.filetype' is ignored.
`file://level1/level2/level3/mbrname`	The same PDS member as above.
`file://level1/level2/level3/level4/`	Sequential (PS-physical sequential) dataset: `LEVEL1.LEVEL2.LEVEL3.LEVEL4`

Note that the 'file://' specification differentiates the files above from logical files; for example, `/level1/level2/level3/level4` in the portable file system (PFS).

File names may also be referred to by a DD name reference that is then defined in the execution JCL. The following is the construct used in this case: `DD:<logical name>(<file name>)`

The <logical name> is a one to eight character name that the program wishes to access; the <file name> is optional.

If the file name is provided, the file with which the <logical name> is associated must be a PDS. Then the member with the name <file name> in this dataset is opened.

If the file is not capable of containing multiple members or the member does not exist, any attempt to open the file fails.

